ON CHANGES IN THE FUNDUS OCULI IN ANÆMIA.

By Robert Saundby, M.D. Edin., M.R.C.P. Lond., Assistant Physician to the Birmingham General Hospital; and Henry Eales, Surgeon to the Birmingham and Midland Eye Hospital.

The purpose of this paper is principally to record the results of a series of careful observations of the state of the fundus oculi in simple chronic anæmia, or chlorosis, as seen in young women, made in order to determine the frequency with which the changes, such as optic neuritis more especially, and the like, signalised by Hirschberg, Gowers, and others, may be found, and to discover whether these or any other changes occur insidiously, or without giving rise to subjective symptoms likely to direct the attention of the patient to the state of her eyes.

These observations have extended over about eighteen months, as we were anxious to select only well-marked examples, and indeed in that period we have been able to collect only fifty cases. For purposes of comparison, and to aid the general inquiry, we have also examined a certain number of examples of anæmia due to hæmorrhage, both spontaneous and traumatic, of which we have notes of eleven cases. In all cases, with one or two exceptions, the fundus was examined after the pupil had been dilated by a mydriatic.

We may as well state at once that the result of these observations does not indicate that structural changes are commonly present in simple chronic anæmia, but still

they are more common than might have been presumed. In all cases of anæmia, including those from hæmorrhage, there was notable pallor of the disc and fundus, in some cases extreme in degree. The veins were usually nearly of the same size and colour as the arteries, though they were sometimes broad and tortuous, either from distension or atony. They pulsated in several cases, but not more often than usual. No pulsation of the arteries was observed in any case.

Of the fifty cases of chlorosis, in two a little whitish yellow spot was found in the retina of one eye—the right eye in the one case, the left eye in the other. In three cases a small black pigment spot was found in the retina —in the left eye in two cases, in the right eye in one. In one case a black spot was seen in the right eye, and a white spot in the left eye. These changes are not of much importance, though they may have been caused by small isolated exudations of lymph, or more probably by hæmorrhages, due to some external cause, such as coughing or straining. Of these six cases two had slight myopia ($\frac{1}{60}$ and $\frac{1}{30}$), while three had hypermetropia ($\frac{1}{72}$, $\frac{1}{36}$, and $\frac{1}{30}$), and one had slight mixed astigmatism, but in no case was the refractive error marked.

In five cases a very *slight blurring of the disc* was noted, not amounting to obvious exudation. The refraction in these five cases was respectively H $\frac{1}{36}$, $\frac{1}{36}$, $\frac{1}{72}$, and $\frac{1}{11}$, and M $\frac{1}{72}$.

In five other cases somewhat more decided changes were observed, four showing slight milky or yellowish ill-defined exudations around the discs or near the fovea or at the periphery of the retina, and one presenting two spindle-shaped hæmorrhages in the right eye, just above the disc. It is noteworthy that all the four cases in which exudations were observed were markedly hypermetropic, viz., H $\frac{1}{8}$, $\frac{1}{9}$, and $\frac{1}{10}$, while the fourth, a girl aged 17, showed a hypermetropia of $\frac{1}{30}$ when not under atropine, so that it is fair to assume that her whole hypermetropia was not less than $\frac{1}{15}$. This is strongly

confirmatory of the view maintained by Gowers that hypermetropia is a potent exciting cause of neuritis and neuro-retinitis, where any predisposition exists ; but it must be admitted that in eight cases which presented a hypermetropia exceeding $\frac{1}{18}$, no exudations and no traces of neuritis were seen.

To return to our recital of the changes met with in the fundus, one case presented a small circumscribed patch of atrophied choroid at the posterior pole, the rest of the fundus being normal and vision unaffected. There was no history of any blow on the eye, and probably this was the result of an isolated hæmorrhage into the choroid. In one case there was extensive choroido-retinitis, with extreme myopia ($\frac{1}{3}$), but as there was abundant evidence of hereditary syphilis, it is not probable that this change was in any way related to anæmia.

If we exclude this and the case with the patch of choroidal atrophy, it leaves sixteen out of the fifty cases which presented some abnormal appearance of the fundus, and, while allowing that in the greatest number the changes were indecisive and of little moment, in five, or, in other words, in ten per cent. of the whole number, they were unequivocal, while in eight per cent. there was evidence of some degree of neuro-retinitis. This proportion is certainly very striking, and indicates that some degree of change of this nature is much more common than would be suggested by the very small number of cases hitherto reported. It is certain that, as regards the general conditions, these cases differed in no important degree from the remainder of the series, which was kept as uniform as possible for the purposes of comparison.

The acuity of vision was in all cases equal to normal, except in one or two instances, in which the defect was owing to such causes as irregular astigmatism, extreme hypermetropia, and the like, so that anæmia does not appear to affect acuity of vision at all ; but it is remarkable that in several cases, in which the pupil was fully

dilated by atropine, a perforated disc held before the eye actually depreciated the acuity of vision, which would seem to indicate a failure of light-perception. It is to be regretted that this point was not noted in all the cases, as our attention was only drawn to it late in the inquiry; but in all cases in which it was looked for it was present, and was unquestionable. Possibly this failure of light-perception may be one factor in the production of the dilated pupil so general in chlorotic girls.

In the series of cases of secondary anæmia, the result of hæmorrhage—eleven in number—one case of severe flooding after labour, with loss of sight, showed primary atrophy of the optic nerves, the retinal vessels being reduced to threads, and vision to simple perception of light. This case conforms to the well known type of optic nerve atrophy after hæmorrhages, usually, as in this case, spontaneous in origin. In one case of hæmorrhage after amputation at the hip for strumous disease of the hip joint, the discs were pale and blurred, and a large striated hæmorrhage surrounded the left. In this case the anæmia was not solely the consequence of the hæmorrhage, as the patient had been for long the subject of an exhausting joint-disease. In two cases black spots were found in the retina, and in one the discs were slightly blurred. In no case did the hypermetropia exceed $\frac{1}{20}$, while one case showed a myopia of $\frac{1}{48}$.

In this latter series, therefore, changes of some sort were found in five cases out of eleven, though definite changes were found in only two. The series is not large enough to give much statistical value to the proportion, and the cases differed too much in their clinical features to enable us to draw any deductions from them.